

Technical Notes

The data in this report come from many sources, including surveys conducted by the National Science Foundation (NSF) and other Federal agencies, and by non-Federal organizations. Many methods of data collection are represented, such as universe surveys, sample surveys, and compilations of administrative records. Users should thus take great care when comparing data from different sources. These data often will not be strictly comparable due—among other things—to differences in definitions, survey procedures, and phrasing of questions.

Survey accuracy is determined by the joint effects of sampling and nonsampling errors. In all of the surveys that are sources of data for this report, efforts are made to minimize these errors. Sampling errors arise because estimates based on a sample will differ from the figures that would have been obtained if a complete census had been taken.

All surveys, whether universe or sample, are also subject to nonsampling errors; these can arise from design, reporting, and processing errors as well as from errors due to faulty response or nonresponse. Nonsampling errors include respondent-based events, such as some respondents interpreting questions differently from other respondents; respondents making estimates rather than giving actual data; and respondents being unable or unwilling to provide complete, correct information. Errors can also arise during the processing of responses, such as recording and keying errors.

Reporting categories

This report draws on information from many sources. As a result, the data presented may not have been collected using comparable terminology or concepts. Efforts have been made to maintain consistency throughout this text, but in some data reporting, it has been necessary to use distinct terminology that does not match that used in other compilations. In other instances, the same terminology has been used throughout, even though the underlying concept differs from source to source, as is the case for disability status.

Racial/ethnic information

Data collection on and reporting of the race/ethnicity of individuals pose several challenges. First, both the naming of population subgroups and their definitions have changed

over time. Second, many of the groups of particular interest are quite small, so it is difficult to measure them accurately without universe surveys. In some instances, sample surveys may not have been of sufficient scope to permit calculation of reliable racial/ethnic population estimates; consequently, results are not shown for all groups. The U.S. Bureau of the Census's Current Population Survey, for example, cannot provide data on American Indians. Data on this population are available from the decennial census. Third, it is easy to overlook or minimize heterogeneity within subgroups when only a single statistic is reported for a total racial/ethnic group. Fourth, data on race/ethnicity are often based on self-identification. These data are less reliable for certain racial/ethnic groups than for others. Data collected at two points in time indicate that self-identification of American Indians is much less reliable than self-identification of other racial/ethnic groups.¹

Information about persons with disabilities

Data on persons with disabilities in S&E are seriously limited for several reasons. First, the operational definitions of disability vary and include a wide range of physical and mental conditions. Different sets of data have used different definitions and thus are not totally comparable. The Americans With Disabilities Act of 1990 (ADA) encouraged progress toward standard definitions. Under ADA, an individual is considered to have a disability if he or she has a physical or mental impairment that substantially limits one or more major life activities, has a record of such impairment, or is regarded as having such an impairment. ADA also contains definitions of specific disabilities.

Second, data about disabilities frequently are not included in comprehensive institutional records (e.g., in registrar records in institutions of higher education). If included at all in institutional records, such information is likely to be kept only in confidential files at an office responsible for providing special services to students. Institutions are unlikely to have information regarding any persons with disabilities who have *not* requested special services. In the case of elementary/secondary school programs receiving funds to provide special education, however, counts for the entire student population identified as having special needs are centrally available.

¹U.S. Bureau of Labor Statistics, *A Test of Methods for Collecting Racial and Ethnic Information* (Washington, DC: U.S. Department of Labor, 1995).

Third, information on persons with disabilities gathered from surveys is often obtained from self-reported responses. Typically, respondents are asked if they have a disability and to specify what kind of disability it is. Resulting data therefore reflect individual perceptions rather than objective measures.

An example—the attempt to provide estimates of the proportion of the undergraduate student population with disabilities—shows how these factors coalesce. Self-reported data from the undergraduate student population, queried on a survey to ascertain patterns of student financial aid, suggest that about 10 percent of this population has some disability. Estimates from population surveys of higher education institutions, in contrast, place the estimate much lower, between 1 and 5 percent. Whether this discrepancy is the result of self-perception, incomplete reporting, nonevident disabilities, or differing definitions is difficult to ascertain.

In the final analysis, although considerable information is available on persons with disabilities and their status in the educational system and in the S&E workforce, it is often not possible to compare the numbers of persons with disabilities from different sources.

Several sources are used in this report for data on persons with disabilities. They include four surveys conducted by the Department of Education's National Center for Education Statistics (NCES); the American Council on Education–University of California–Los Angeles Survey of the American Freshman: National Norms; NSF's Survey of Earned Doctorates (SED) and the three Scientists and Engineers Statistics Data System (SESTAT) surveys; and the U.S. Bureau of the Census's Survey of Income and Program Participation (SIPP). These sources are described in more detail later in this appendix; following is a brief description of how each survey treats the issue of disability.

- **NCES surveys.** Four NCES surveys collect information on disability—the National Education Longitudinal Study, Beginning Postsecondary Students Longitudinal Study, Baccalaureate and Beyond Study, and National Postsecondary Student Aid Study (NPSAS). Text table A-1 provides a quick comparison of the disability-related information collected by these surveys.
- **Survey of the American Freshman: National Norms.** The National Norms survey conducted by the American Council on Education and the University of California–Los Angeles asks if the student has a disability and, if so, whether the student has a disability such as hearing, speech, orthopedic, learning disability, health related, or other. The student is asked to mark all that apply.

- **NSF surveys.** The NSF surveys, the SED and the SESTAT surveys, provide individual respondents' answers. The SED asks if the respondent has a disability, then asks the respondent to mark what category applies to the disability. The SESTAT surveys ask the degree of difficulty—none, slight, moderate, severe, or unable to do—a person with a disability(ies) may have in performing life activities. Those respondents who answered moderate, severe, or unable to do for any activity were classified as disabled. Text table A-2 compares SED and SESTAT treatment of disability.
- **Survey of Income and Program Participation.** The disability supplements that have been asked in the Census Bureau's SIPP were designed to be consistent with the ADA definition of disability. The supplements obtain information on the ability to perform specific functional activities (seeing, hearing, having one's speech understood, lifting and carrying, climbing stairs, and walking); certain ADLs, or activities of daily living (getting around inside the home, getting in and out of a bed or chair, bathing, dressing, eating, and toileting), and certain IADLs, or instrumental activities of daily living (going outside the home, keeping track of money and bills, preparing meals, doing light housework, taking prescription medicines in the right amount at the right time, and using the telephone). The survey also collects information on the use of such special aids as wheelchairs and canes, the presence of certain conditions related to mental functioning, and the ability to work at a job or business.

In SIPP, people 15 years old and over were identified as having a disability if they met any of the following criteria:

- Used a wheelchair or were a long-term user of a cane, crutches, or a walker
- Had difficulty performing one or more functional activities (seeing, hearing, speaking, lifting/carrying, using stairs, or walking)
- Had difficulty with one or more activities of daily living
- Had difficulty with one or more instrumental activities of daily living (the IADLs included going outside the home, keeping track of money and bills, preparing meals, doing light housework, taking prescription medicines in the right amount at the right time, and using the telephone)

Text table A-1

Selected characteristics of NCES surveys with data about students with disabilities

Characteristic	National Education Longitudinal Study	Beginning Postsecondary Students Longitudinal Study	Baccalaureate and Beyond Study	National Postsecondary Student Aid Study
Survey year	1988	1990/94	1993/94	1996
Questionnaire respondent	Parent	Student	Student	Student
Question as asked in the survey	In your opinion, does your eighth grader have any of the following problems? -AND- Has your eighth grader ever received special services for any or all of the following?	Do you have any of the following conditions?	Do you have any of the following disabilities?	Do you have any disabilities, such as a hearing, speech, or mobility impairment, or vision problems that can't be corrected with glasses?
Disability type as categorized by the survey				
Visual impairment	Visual handicap (not correctable by glasses)	Visual handicap	Vision impairment that cannot be corrected with glasses, or are you legally blind?	Legally blind or have a vision impairment that cannot be corrected with glasses
Hearing impairment or deaf	Hearing problem -OR- deafness	Hard-of-hearing -OR- deafness	Hearing impairment	A hearing impairment
Speech impairment	Speech problem	Speech disability	Speech disability or limitation	A speech disability or limitation
Orthopedic impairment	Orthopedic problem (for example: club foot, absence of arm or leg, cerebral palsy, amputation, polio)	Orthopedic handicap	Orthopedic or mobility limitation	An orthopedic or mobility limitation
Learning disability	Specific learning problem (for example: dyslexia or other reading, writing, or math disability)	Specific learning disability	Specific learning disability	A specific learning disability
Other disability or impairment	Other health problem (includes mental retardation) -OR- emotional problem -OR- other physical disability	Other health impairment	Any other type of limitations, disabilities, or handicaps	Other health-related disability or limitation

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Students With Disabilities in Postsecondary Education: A Profile of Preparation, Participation, and Outcomes*, NCES 1999-187 (Washington, DC, 1999), p. 6.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 2002

Text table A-2

SED and SDR definitions of disability

SED	SESTAT surveys
Disability (mark all that apply)	Difficulty with physical functions (mark one choice for each)
Visual	SEEING words or letters in ordinary newsprint (with glasses/contact lenses if you usually wear them)
Auditory	HEARING what is normally said in conversation with another person (with a hearing aid, if you usually wear one)
Orthopedic	WALKING without human assistance or using stairs (mobility)
[No corresponding category in SED]	LIFTING or carrying something as heavy as 10 pounds, such as a bag of groceries
Vocal	[No corresponding category in SESTAT]
Other	[No corresponding category in SESTAT]

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- Had one or more specified conditions (a learning disability, mental retardation or another developmental disability, Alzheimer's disease, or some other type of mental or emotional condition)
- Were limited in their ability to do housework
- Were 16 to 67 years old and limited in their ability to work at a job or business
- Were receiving Federal benefits based on an inability to work

People age 15 and over were identified as having a severe disability if they were unable to perform one or more functional activities; needed personal assistance with an ADL or IADL; used a wheelchair; were a long-term user of a cane, crutches, or a walker; had a developmental disability or Alzheimer's disease; were unable to do housework; were receiving Federal disability benefits; or were 16 to 67 years old and unable to work at a job or business.

Primary data sources

Data from many sources are presented in this report. This section provides summary descriptions of major sources and information on the location of more detailed survey descriptions.

Primary NSF sources

The following sources from the National Science Foundation's Division of Science Resources Statistics (SRS) were used for data tables in this publication. Published data tables from these surveys may be accessed on the SRS website <http://www.nsf.gov/sbe/srs>. In addition, researchers may access data directly from the SESTAT or WebCASPAR database systems, which can also be accessed from the SRS website.

Survey of Earned Doctorates

The Survey of Earned Doctorates has been conducted annually since 1957 for the National Science Foundation, the U.S. Department of Education, the National Endowment for the Humanities, the National Institutes of Health, and the U.S. Department of Agriculture. This is a census survey of all recipients of research doctoral degrees such as the Ph.D. or D.Sc.; it excludes the recipients of first-professional degrees such as the J.D. or M.D. Therefore, SED data are restricted to research doctorates.

Data for the SED are collected directly from individual doctorate recipients contacted through graduate deans at all U.S. universities. The recipients are asked to provide information on the field and specialty of their degree as well as

their personal educational history, selected demographic data, and information on their postgraduate work and study plans. Approximately 95 percent of the annual cohort of doctorate recipients respond to the questionnaire.

Partial data from public sources, such as field of study, are added to the file for nonrespondents. No imputations are made, however, for nonresponse for data not available elsewhere, such as race/ethnicity information. The data for a given year include all doctorates awarded in the 12-month period ending on June 30 of that year. Information on the SED can be found on the Web at <http://www.nsf.gov/sbe/srs/ssed/start.htm>.

Survey of Graduate Students and Postdoctorates in Science and Engineering

The data collected in the Survey of Graduate Students and Postdoctorates in Science and Engineering represent national estimates of graduate enrollment and postdoctoral employment at the beginning of the academic year in all academic institutions in the United States that offer doctorate or master's degree programs in any science or engineering field. Included are data for all branch campuses; affiliated research centers; and separately organized components such as medical or dental schools, schools of nursing, or schools of public health. In fall 1999, the survey universe consisted of 720 reporting units at 599 graduate institutions. Data are collected at the academic department level.

Available information includes full-time graduate students by source and mechanism of support, including data on women and first-year students enrolled full time, part-time graduate students by sex, and citizenship and racial/ethnic background of all graduate students. In addition, detailed data on postdoctorates are available by source of support, sex, and citizenship, including separate data on those holding first-professional doctorates in the health fields; summary information on other doctorate nonfaculty research personnel is also included.

NSF has collected data on graduate S&E enrollment and postdoctoral appointees since 1966. From fall 1966 through fall 1971, data from a limited number of doctorate-granting institutions were collected through the NSF Graduate Traineeship Program, which requested data only on those S&E fields supported by NSF. Beginning with the fall 1972 survey, this data collection effort was assigned to SRS's Universities and Nonprofit Institutions Studies Group. It was gradually expanded during the period 1972–75 to include additional S&E fields as well as all institutions known to have programs leading to the master's or doctorate degree. Because of this expansion, data for 1974 and earlier years are not strictly comparable with 1975 and later data. Information on the Graduate Student Survey can be found on the Web at <http://www.nsf.gov/sbe/srs/sgss/start.htm>.

SESTAT data system

In the 1990s, SRS redesigned its data system covering scientists and engineers. Termed SESTAT, the new data system integrates data from three SRS surveys—the Survey of Doctorate Recipients, the National Survey of College Graduates, and the National Survey of Recent College Graduates. The integration of the SESTAT surveys requires complementary sample populations and reference periods, matching survey questions, procedures, and field definitions, as well as weighting adjustments for any overlapping populations.

The surveys provide data on educational background, occupation, employment, and demographic characteristics. These surveys are of individuals and currently have a combined sample size of about 87,200, representing a population of about 13 million scientists and engineers. Each of the three surveys that makes up the SESTAT data system collects new data every 2 years. The data reported in this publication were collected in 1999.

SESTAT defines scientists and engineers as residents of the United States with a baccalaureate degree or higher who, as of the study's reference period, were not institutionalized, were age 75 or less, and were either educated as or working as a scientist or engineer. A baccalaureate or higher degree is a bachelor's, master's, doctorate, or professional degree. To meet the scientist or engineer requirement, the U.S. resident had to (1) have at least one baccalaureate or higher degree in an S&E field or (2) have a baccalaureate or higher degree in a non-S&E field but worked in a science or engineering occupation as of April 15, 1993. For the 1999 SESTAT surveys, the reference period was the week of April 15, 1999.

Some elements of SESTAT's desired target population were not included within the target populations of any of the three SESTAT component surveys in the 1990s. Bachelor's and master's level S&E educated personnel missing from the survey frames are predominately:

- U.S. residents as of the survey reference date whose bachelor's and/or master's degrees in S&E were received prior to April 1990 or from a foreign institution, who resided outside the United States on April 1, 1990, but not with the U.S. armed forces stationed abroad; or
- U.S. residents as of the survey reference date with no baccalaureate or higher degree in any field as of April 1, 1990, who were awarded a degree in S&E after June 1998 by a U.S. institution or after April 1990 by a foreign institution

Persons with at least a bachelor's degree who are working in S&E jobs, but have no degree in an S&E field, are underrepresented in the SESTAT database after 1993 because the surveys do not capture new people entering these occupations who were not educated in S&E fields in this decade.

Doctorate level S&E-trained personnel missing from the survey frames are predominately:

- U.S. residents as of the survey reference date with doctorates in S&E received after June 1998 or from a foreign institution, with no baccalaureate or higher degree in any field as of April 1, 1990, and no bachelor's or master's degree in S&E received from a U.S. institution between April 1, 1990, and June 1998; or
- U.S. residents as of the survey reference date with doctorates in S&E received after June 1998 or from a foreign institution but with no bachelor's or master's S&E degree received from a U.S. institution between April 1, 1990, and June 1998, who resided outside the United States on April 1, 1990, but not with the U.S. armed forces stationed abroad

SESTAT classifies the following broad categories as S&E occupations: computer and mathematical scientists, life and related scientists, physical and related scientists, social and related scientists, and engineers. Postsecondary teachers are included within each of these groups. The following are considered non-S&E occupations: top- and mid-level managers; teachers, except S&E postsecondary teachers; technicians/technologists, including computer programmers; people in health and related occupations, social services and related occupations, sales and marketing occupations, and other non-S&E occupations—for example, artists, broadcasters, editors, entertainers, public relations specialists, writers, clerical and administrative support personnel, farmers, foresters, lawyers, judges, librarians, archivists, curators, actuaries, food service personnel, historians (except science and technology), architects, construction tradespeople, mechanics and repairers, and those involved in precision/production occupations, operators (for example, machine set-up, machine operators and tenders, fabricators, assemblers) and related occupations, transportation/material moving occupations and protective and other service occupations. Information on SESTAT can be found on the Web at <http://sestat.nsf.gov/>.

Primary non-NSF sources

The following non-NSF sources were used for data tables in this report.

The Integrated Postsecondary Education Data System Survey: Fall Enrollment, Completions, and Institutional Characteristics

Contact: National Center for Education Statistics
U.S. Department of Education
1990 K Street, NW
Washington, DC 20006
(202) 502-7300
<http://nces.ed.gov/ipeds/>

The Integrated Postsecondary Education Data System (IPEDS) Survey began in 1986 as a supplement to and replacement for the Higher Education General Information Survey (HEGIS), which began in 1966. HEGIS annually surveyed institutions listed in the current NCES *Education Directory of Colleges and Universities*; IPEDS surveys all postsecondary institutions, including universities and colleges and the institutions that offer technical and vocational education. IPEDS consists of several integrated component surveys that obtain information on types of institutions where postsecondary education is available, student participants, programs offered and completed, and the human and financial resources involved in the delivery of postsecondary education. IPEDS include surveys of institutional characteristics, fall enrollment, completions, finance, and graduation rates.

The **IPEDS Institutional Characteristics Survey** provides the basis for the universe of institutions reported in the *Education Directory of Colleges and Universities*. The universe includes institutions that met certain accreditation criteria and offered at least a 1-year program of college-level studies leading toward a degree. Each fall, institutions listed in the previous year's directory are asked to update information on their school's characteristics.

The **IPEDS Completions Survey** replaces and extends the HEGIS Degrees and Other Formal Awards Conferred Survey. It is administered to a census of institutions offering degrees at the bachelor's degree level and above, 2-year institutions, and less-than-2-year institutions.

The **IPEDS Fall Enrollment Survey** replaces and extends the previous HEGIS surveys of enrollment in institutions of higher education.

National Assessment of Educational Progress

Contact: National Center for Education Statistics
U.S. Department of Education
1990 K Street, NW
Washington, DC 20006
(202) 502-7300
<http://nces.ed.gov/NAEP/>

The National Assessment of Educational Progress (NAEP) is sponsored by NCES and has been conducted since 1983 by the Educational Testing Service. The overall goal of the project is to determine the nation's progress in achievement in selected subject areas by elementary and secondary school students. Accordingly, NAEP encompasses a series of national sample surveys designed to assess students in subject areas such as reading, mathematics, science, writing, and history. Begun in 1969, NAEP has periodically surveyed the educational accomplishments of 9-, 13-, and 17-year-old students (and, in recent years, those in grades 4, 8, and 12 as well).

Since 1986, NAEP has included both main and long-term trend assessments. Both assessments use a complex multistage stratified sample of schools, selected to ensure adequate representation of schools with high enrollment of blacks and Hispanics. Both assessments historically excluded students with limited English proficiency and students receiving special education services whom school officials judged unable to respond meaningfully to the assessment.

Beginning with NAEP assessments in 1996, attempts were made to have more of the students who were classified as having severe mental or physical disabilities or limited English proficiency included in the assessment. Accommodations were implemented for students who would have been excluded in the past. Spanish-speaking students classified as with limited English proficiency were given the option of using a bilingual test booklet in mathematics in a portion of the sample. In addition, English-Spanish glossaries were provided at all three grades for designated science books. Other accommodations (such as earphones for the hearing impaired, signers for the deaf, magnifying equipment, and translators) were allowed if provided by the school and specified in the student's Individual Education Plan. Students who could not be accommodated either by the NAEP administrators or by their schools were excluded from the assessment. A study to determine the impact of the revised inclusion rules and accommodations was conducted in the 1996 assessment.

The main assessments estimate student achievement at a cross-sectional point in time. The cross-sectional samples use innovations in assessment methodology and population definition. In 1996, data were collected from approximately 35,000 students in grades 4, 8, and 12 for the science assessments and from approximately 33,000 students in grades 4, 8, and 12 for the mathematics assessments. Data were also collected from these students' principals and a sample of their teachers.

The long-term trend assessments estimate the current status of achievement using the same sampling and assessment methodology used in previous years. In 1999, data were collected from approximately 16,000 students ages 9, 13, and 17 for the long-term trend science and mathematics assessments.

Performance data are reported for the nation and for various subgroups categorized by variables such as region, sex, race/ethnicity, parental education, type of school, and type and size of community. Beginning with the 1990 assessment, three reporting levels were established for NAEP results: basic, proficient, and advanced. Since 1984, NAEP was conducted in some subject areas every other year in even-numbered years. Beginning in 1999, it has been conducted annually.

The National Postsecondary Student Aid Study

Contact: National Center for Education Statistics
U.S. Department of Education
1990 K Street, NW
Washington, DC 20006
(202) 502-7300
<http://nces.ed.gov/npsas/>

The National Postsecondary Student Aid Study was established by NCES to collect information concerning financial aid allocated to students enrolled in U.S. postsecondary institutions. NPSAS was first administered in the fall of the 1986/87 academic year. NCES conducted subsequent cycles of NPSAS for the 1989/90, 1992/93, and 1995/96 school years. Estimates from the 1996 NPSAS sample are generally comparable to those from the 1993 and 1990 samples but not to those from the 1987 sample.

The 1995/96 survey gathered information from about 60,000 undergraduate and graduate students selected from registrar lists of enrollees at about 800 postsecondary institutions. The sample included students who did and did not receive financial aid, as well as students' parents. Student information, such as field of study, educational level, and attendance status (part or full time), was obtained from registrar records. Types and amounts of financial aid and family financial characteristics were abstracted from school

financial aid records. Parents of students were also sampled to compile data concerning family composition and parental financial characteristics.

The Third International Mathematics and Science Study-Repeat

Contact: National Center for Education Statistics
U.S. Department of Education
1990 K Street, NW
Washington, DC 20006
(202) 502-7421
<http://nces.ed.gov/timss/>

The Third International Mathematics and Science Study-Repeat (TIMSS-R), conducted in 1999, provides information on U.S. progress toward the goal of being first in the world in mathematics and science achievement. Eighth-grade students in 38 countries participated in TIMSS-R. NCES and NSF provided the funding to carry out the U.S. participation in this large-scale assessment. The TIMSS-R instruments were designed to assess eighth-grade student achievement in mathematics and science. Additional information was collected through teacher, student, and school questionnaires. The teacher questionnaire asked about topics such as attitudes and beliefs about teaching and learning, teaching assignments, class size and organization, topics covered, the use of various teaching tools, instructional practices, and participation in professional development. The student questionnaire asked about daily activities, family attributes, educational resources in the home, attitudes and beliefs about learning, instructional processes in the classroom, and study habits and homework. The principal questionnaire concerned community attributes, personnel, teaching assignments, policy and budget responsibilities, curriculum, enrollment, behavioral problems, instructional organization, and mathematics and science courses offered. In the United States, a national probability sample was drawn that resulted in 221 schools and 9,072 students participating at the eighth-grade level.

Engineering Workforce Commission Survey of Engineering and Technology Enrollments

Contact: Matt Doster
Engineering Workforce Commission
American Association of Engineering Societies
1111 19th Street, NW
Suite 403
Washington, DC 20036
(202) 546-2237
<http://www.aaes.org/ewc/>

For more than 30 years, the Engineering Workforce Commission (EWC) has conducted annual surveys of enrollments and degrees in engineering programs. EWC collected data on engineering enrollments and degrees in 1999 from 341 institutions, including all of those with curricula approved by the Accreditation Board for Engineering and Technology (ABET), as well as data on engineering technology from 280 schools. EWC counts the number of students studying for engineering degrees at all ABET-accredited engineering schools throughout the United States. Historically, EWC has also included schools that are not ABET accredited for a variety of reasons unique to each school. Some such schools are in the process of obtaining ABET accreditation; others have simply asked to be included in the survey. The response rate to the 1999 survey was 93 percent for ABET-accredited schools and 85 percent for non-ABET schools. Each year, EWC obtains data from all schools included in the previous year's survey so as to ensure accurate time-series comparisons.

Survey of Income and Program Participation

Contact: Michael McMahon
Current Population Reports
U.S. Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233
(301) 457-3819

The Survey of Income and Program Participation conducted by the Census Bureau provides information on the economic situation of households and persons in the United States. The survey collects data on basic social and demographic characteristics of persons in households, labor force activity, type and amount of income, participation status in various programs, and various supplementary modules—for example, work history, health characteristics (including disability), assets and liabilities, and education and training.

The 1996 panel of the SIPP provides the latest available data on the disability status of the noninstitutionalized population of the United States. A supplement containing an extensive set of questions about disability status was included as part of the fifth wave of the 1996 panel, which was fielded between August and November 1997. The total sample size for this study was approximately 32,000 interviewed households.

Sampling errors

Sampling errors occur when estimates are derived from a sample rather than from the entire population. The sample used for any particular survey is only one of a large number of possible samples of the same size and design that could have been selected. Even if the same questionnaire and instructions were used, the estimates from each sample would differ from the others. This difference, termed sampling error, occurs by chance, and its variability is measured by the standard error associated with a particular estimate.

The standard error of a sample survey estimate measures the precision with which an estimate from one sample approximates the true population value, and thus can be used to construct a confidence interval for a survey parameter to assess the accuracy of the estimate. Standard errors for the numbers in the appendix tables are provided where available. Tables A-1 through A-5 provide standard errors for tables in chapters 1 and 2. Tables A-6 through A-9 provide approximate standard errors for totals for different segments of the S&E population from the NSF SESTAT surveys. Information provided in tables A-10 through A-13 allows the user to calculate approximate standard errors for estimates derived from the NSF SESTAT surveys. The following formula can be used for estimating the standard error of totals:

$$SE(\hat{Y}) = [\hat{\beta}_0 \hat{Y}^2 + \hat{\beta}_1 \hat{Y}]^{1/2}$$

where $SE(\hat{Y})$ is the predicted standard error of the estimated total \hat{Y} and $\hat{\beta}_0$ and $\hat{\beta}_1$ are the regression coefficients provided in tables A-10 through A-13. Approximate standard errors for percentages can be calculated from the following formula:

$$SE(\hat{P}) = \{[\hat{\beta}_1 / \hat{Y}[\hat{P}(100 - \hat{P})]]\}^{1/2}$$

where $SE(\hat{P})$ is the predicted standard error for the percentage, \hat{Y} is the estimated number of persons in the base of the percentage, and $\hat{\beta}_1$ is the regression coefficient provided in tables A-10 through A-13. A 95 percent confidence interval for an estimate can be calculated by multiplying 1.96 by the standard error of the estimate, and adding and subtracting the resulting amount from the estimate.

Appendix table A-1

Standard errors for appendix table 1-17: Percentage of 25- to 29-year-olds who had completed high school, by race/ethnicity and sex: 1990–99

Year	Total			White, non-Hispanic			Black, non-Hispanic			Hispanic		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
1990.....	0.4	0.6	0.5	0.4	0.6	0.5	1.4	2.1	1.9	2.0	2.7	2.8
1991.....	0.4	0.6	0.5	0.4	0.6	0.5	1.4	1.9	1.9	2.0	2.8	2.9
1992.....	0.4	0.5	0.5	0.4	0.6	0.5	1.4	2.0	2.0	2.0	2.7	2.9
1993.....	0.4	0.6	0.5	0.4	0.6	0.5	1.4	1.9	2.0	1.9	2.6	2.8
1994.....	0.4	0.5	0.5	0.4	0.5	0.5	1.1	1.7	1.5	1.2	1.7	1.8
1995.....	0.4	0.5	0.5	0.3	0.5	0.5	1.0	1.5	1.5	1.3	1.7	1.8
1996.....	0.4	0.5	0.5	0.4	0.5	0.5	1.1	1.6	1.6	1.3	1.7	1.9
1997.....	0.4	0.5	0.5	0.3	0.5	0.5	1.1	1.7	1.4	1.2	1.7	1.8
1998.....	0.4	0.5	0.5	0.3	0.5	0.4	1.0	1.5	1.4	1.2	1.7	1.8
1999.....	0.4	0.6	0.5	0.4	0.5	0.5	1.0	1.5	1.4	1.2	1.7	1.8

SOURCE: U.S. Bureau of the Census, March Current Population Survey, various years.

Appendix table A-2

Standard errors for appendix table 2-1: Percentage of 25- to 29-year-old high school completers with some college and percentage that completed college, by sex and race/ethnicity: 1990–2000

Year	Total			Whites, non-Hispanic			Blacks, non-Hispanic			Hispanics		
	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women
Percent with some college												
1990.....	0.6	0.8	0.8	0.7	1.0	0.9	2.0	2.9	2.7	2.6	3.6	3.6
1991.....	0.6	0.8	0.8	0.7	1.0	1.0	2.0	2.8	2.7	2.6	3.6	3.8
1992.....	0.6	0.9	0.8	0.7	1.0	1.0	2.0	2.9	2.8	2.6	3.5	3.8
1993.....	0.6	0.9	0.8	0.7	1.0	1.0	2.0	2.9	2.8	2.5	3.5	3.6
1994.....	0.6	0.8	0.8	0.6	0.9	0.9	1.7	2.5	2.3	1.6	2.2	2.4
1995.....	0.6	0.8	0.8	0.6	0.9	0.9	1.6	2.4	2.3	1.7	2.3	2.4
1996.....	0.6	0.8	0.8	0.7	0.9	0.9	1.7	2.6	2.4	1.7	2.3	2.5
1997.....	0.6	0.8	0.8	0.7	0.9	0.9	1.7	2.6	2.3	1.6	2.3	2.3
1998.....	0.6	0.8	0.8	0.7	1.0	0.9	1.7	2.5	2.3	1.6	2.2	2.3
1999.....	0.6	0.8	0.8	0.7	1.0	0.9	1.7	2.6	2.2	1.6	2.4	2.3
2000.....	0.6	0.8	0.8	0.7	1.0	0.9	1.7	2.7	2.3	1.6	2.3	2.2
Percent that completed college												
1990.....	0.5	0.8	0.7	0.6	0.9	0.8	1.5	2.3	1.9	1.8	2.4	2.7
1991.....	0.5	0.8	0.7	0.6	0.9	0.9	1.3	2.0	1.8	2.0	2.6	3.0
1992.....	0.5	0.8	0.8	0.6	0.9	0.9	1.4	2.0	1.9	1.9	2.5	2.8
1993.....	0.5	0.8	0.8	0.6	0.9	0.9	1.5	2.1	2.1	1.7	2.3	2.6
1994.....	0.5	0.7	0.7	0.6	0.9	0.8	1.2	1.8	1.7	1.1	1.4	1.7
1995.....	0.5	0.7	0.7	0.6	0.9	0.9	1.3	1.9	1.7	1.2	1.6	1.8
1996.....	0.5	0.8	0.8	0.7	0.9	0.9	1.3	1.8	1.9	1.2	1.7	1.8
1997.....	0.6	0.8	0.8	0.7	0.9	0.9	1.3	1.8	1.8	1.2	1.7	1.9
1998.....	0.6	0.8	0.8	0.7	0.9	1.0	1.3	1.9	1.8	1.2	1.6	1.7
1999.....	0.6	0.8	0.8	0.7	1.0	1.0	1.3	1.9	1.8	1.2	1.6	1.7
2000.....	0.6	0.8	0.8	0.7	1.0	1.0	1.4	2.2	1.9	1.2	1.6	1.8

SOURCE: U.S. Bureau of the Census, March Current Population Survey, various years.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 2002

Appendix table A-3

Standard errors for appendix table 2-3: Percentage distribution of 1988 eighth graders, by high school completion status and postsecondary education enrollment, by disability status and type: 1994

Disability status and type	High school completion status			
	Enrolled in high school/working toward GED	Dropped out	High school diploma	GED or equivalent certificate
Total	0.32	0.48	0.71	0.46
Without disabilities.....	0.32	0.53	0.75	0.51
With disabilities.....	1.41	1.23	1.92	0.89
Visual impairment.....	5.05	1.22	5.97	3.78
Hearing impairment or deaf.....	4.14	1.78	5.12	3.72
Speech impairment.....	2.06	2.03	3.02	1.22
Orthopedic impairment.....	2.44	6.64	6.66	1.23
Learning disability.....	1.79	1.85	2.79	1.44
Other disability or impairment ^a	3.02	2.36	3.60	1.24

^aParent reported student had any other disability including health problems, emotional problems, mental retardation, or other physical disabilities and had received services for it.

NOTE: GED refers to passing the General Education Development exam.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Students With Disabilities in Postsecondary Education: A Profile of Preparation, Participation, and Outcomes*, NCES 1999-187 (Washington, DC, 1999).

Appendix table A-4

Standard errors for appendix table 2-13: Percentage of undergraduates receiving various types of aid and average amount of aid received, by sex and race/ethnicity: Academic year 1995/96

Sex and race/ethnicity	Any aid	Grants	Loans	Work-study	Other
Male.....	1.0	0.8	0.7	0.3	0.4
Female.....	0.9	0.8	0.7	0.3	0.4
White, non-Hispanic.....	0.8	0.7	0.6	0.3	0.4
Asian/Pacific Islander.....	1.9	1.8	1.4	0.7	0.7
Black, non-Hispanic.....	1.9	1.7	1.7	0.6	0.9
Hispanic.....	2.1	2.0	1.6	0.9	0.6
American Indian/Alaskan Native.....	4.6	4.5	3.7	1.4	3.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995–96 National Postsecondary Student Aid Study.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 2002

Appendix table A-5

Standard errors for appendix table 2-14: Percentage distribution of 1989/90 beginning postsecondary students seeking bachelor's degrees, by persistence toward and completion of bachelor's and other degrees, by sex and race/ethnicity: Spring 1994

Sex and race/ethnicity	Completed a degree			Still enrolled for bachelor's ^b	No degree, no longer enrolled toward bachelor's ^c
	Bachelor's	Associate's ^a	Certificate ^a		
Male.....	1.7	1.0	0.7	1.5	1.7
Female.....	1.9	1.3	0.8	1.2	1.6
White, non-Hispanic.....	1.6	1.0	0.6	1.0	1.3
Asian/Pacific Islander.....	6.0	3.1	0.6	4.8	6.4
Black, non-Hispanic.....	3.3	3.1	1.2	2.8	4.1
Hispanic.....	4.8	2.2	3.3	4.6	5.5
American Indian/Alaskan Native.....	S	S	S	S	S

S data suppressed for reasons of confidentiality and/or data reliability

^aIncludes only students who are no longer working toward a bachelor's degree but who have completed another type of degree or award.

^bIncludes students who have completed another type of degree or award but are still working toward a bachelor's degree.

^cIncludes students who are no longer enrolled and students who are still enrolled but no longer working toward a bachelor's degree.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education 1998*, NCES 98-013 (Washington, DC: U.S. Government Printing Office, 1998), supplemental table 12-1.

Appendix table A-6
Approximate standard errors for scientists and engineers in 1999 (total population)

Estimated number	Total	Male	Female	White	Nonwhite
100.....	175	168	172	178	132
200.....	248	237	244	251	186
500.....	392	375	385	397	294
750.....	480	460	472	486	360
1,000.....	555	531	545	561	416
2,000.....	784	750	771	794	588
3,000.....	961	919	944	972	721
4,000.....	1,109	1,061	1,090	1,123	832
5,000.....	1,240	1,186	1,218	1,255	930
10,000.....	1,754	1,677	1,722	1,775	1,314
25,000.....	2,771	2,650	2,719	2,804	2,072
50,000.....	3,915	3,742	3,836	3,961	2,919
100,000.....	5,527	5,278	5,400	5,590	4,092
250,000.....	8,690	8,276	8,417	8,781	6,301
500,000.....	12,174	11,540	11,612	12,281	8,495
750,000.....	14,767	13,930	13,855	14,871	9,869
1,000,000.....	16,885	15,846	15,564	16,973	10,742
2,000,000.....	22,912	21,003	19,360	22,844	10,725
3,000,000.....	26,824	23,877	19,942	26,483	na
4,000,000.....	29,475	25,258	17,633	28,749	na
5,000,000.....	31,190	25,393	10,698	29,957	na
6,000,000.....	32,117	24,302	na	30,232	na
7,000,000.....	32,326	21,801	na	29,602	na
8,000,000.....	31,830	17,289	na	28,004	na
9,000,000.....	30,595	7,842	na	25,257	na
10,000,000.....	28,525	na	na	20,912	na
11,000,000.....	25,417	na	na	13,506	na
12,000,000.....	20,811	na	na	na	na

na not applicable

NOTES: "Scientists and engineers" include all people holding a bachelor's degree or higher in an S&E field plus people holding a non-S&E bachelor's degree or higher who were employed in an S&E occupation during the 1990s SESTAT surveys. "White" excludes persons of Hispanic origin, who are instead included in the "nonwhite" category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT).

Women, Minorities, and Persons With Disabilities in Science and Engineering: 2002

Appendix table A-7

Approximate standard errors for bachelor's scientists and engineers in 1999

Estimated number	Total	Male	Female	White	Nonwhite
100.....	186	183	179	191	138
200.....	263	258	254	270	196
500.....	416	409	401	426	309
750.....	509	500	491	522	379
1,000.....	588	578	567	603	437
2,000.....	832	817	802	853	618
3,000.....	1,018	1,001	982	1,044	757
4,000.....	1,176	1,155	1,134	1,206	874
5,000.....	1,315	1,292	1,268	1,348	977
10,000.....	1,859	1,826	1,792	1,906	1,380
25,000.....	2,937	2,885	2,829	3,012	2,177
50,000.....	4,150	4,073	3,989	4,254	3,065
100,000.....	5,858	5,743	5,610	6,004	4,298
250,000.....	9,209	8,998	8,716	9,431	6,615
500,000.....	12,898	12,528	11,953	13,192	8,915
750,000.....	15,640	15,098	14,169	15,975	10,351
1,000,000.....	17,878	17,146	15,799	18,235	11,259
2,000,000.....	24,227	22,545	18,831	24,554	11,169
3,000,000.....	28,320	25,356	17,747	28,481	na
4,000,000.....	31,061	26,418	11,433	30,941	na
5,000,000.....	32,791	25,946	na	32,271	na
6,000,000.....	33,667	23,851	na	32,609	na
7,000,000.....	33,755	19,617	na	31,988	na
8,000,000.....	33,061	11,006	na	30,347	na
9,000,000.....	31,533	na	na	27,506	na
10,000,000.....	29,042	na	na	23,024	na
11,000,000.....	25,302	na	na	15,540	na
12,000,000.....	19,613	na	na	na	na

na not applicable

NOTES: "Scientists and engineers" include all people holding a bachelor's degree or higher in an S&E field plus people holding a non-S&E bachelor's degree or higher who were employed in an S&E occupation during the 1990s SESTAT surveys. "White" excludes persons of Hispanic origin, who are instead included in the "nonwhite" category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT).

Appendix table A-8
Approximate standard errors for master's scientists and engineers in 1999

Estimated number	Total	Male	Female	White	Nonwhite
100.....	168	161	179	177	137
200.....	237	228	252	251	193
500.....	375	360	399	396	305
750.....	459	441	489	485	374
1,000.....	530	509	564	560	432
2,000.....	749	720	798	793	610
3,000.....	918	882	977	971	747
4,000.....	1,060	1,019	1,129	1,121	863
5,000.....	1,185	1,139	1,262	1,253	964
10,000.....	1,675	1,610	1,783	1,772	1,363
25,000.....	2,648	2,543	2,815	2,801	2,149
50,000.....	3,741	3,590	3,971	3,959	3,026
100,000.....	5,283	5,059	5,587	5,592	4,242
250,000.....	8,316	7,912	8,696	8,813	6,526
500,000.....	11,670	10,983	11,965	12,396	8,786
750,000.....	14,181	13,194	14,234	15,099	10,188
1,000,000.....	16,246	14,932	15,937	17,337	11,064
2,000,000.....	22,228	19,308	19,460	23,962	10,816
3,000,000.....	26,277	21,201	19,341	28,649	na
4,000,000.....	29,208	21,284	15,497	32,255	na
5,000,000.....	31,336	19,580	na	35,114	na
6,000,000.....	32,817	15,512	na	37,397	na
7,000,000.....	33,738	4,970	na	39,207	na
8,000,000.....	34,144	na	na	40,605	na
9,000,000.....	34,052	na	na	41,634	na
10,000,000.....	33,459	na	na	42,320	na
11,000,000.....	32,337	na	na	42,681	na
12,000,000.....	30,628	na	na	42,723	na

na not applicable

NOTES: "Scientists and engineers" include all people holding a bachelor's degree or higher in an S&E field plus people holding a non-S&E bachelor's degree or higher who were employed in an S&E occupation during the 1990s SESTAT surveys. "White" excludes persons of Hispanic origin, who are instead included in the "nonwhite" category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT).

Women, Minorities, and Persons With Disabilities in Science and Engineering: 2002

Appendix table A-9

Approximate standard errors for doctoral scientists and engineers in 1999

Estimated number	Total	Male	Female	White	Nonwhite
100.....	99	97	94	104	85
200.....	139	137	133	146	121
500.....	220	217	210	232	191
750.....	270	266	258	284	234
1,000.....	312	307	298	327	270
2,000.....	441	434	421	463	381
3,000.....	539	532	515	567	466
4,000.....	623	614	595	655	538
5,000.....	696	686	665	732	601
10000.....	984	969	939	1,034	845
25,000.....	1,554	1,525	1,478	1,631	1,315
50000.....	2,192	2,141	2,074	2,296	1,807
100,000.....	3,084	2,982	2,890	3,218	2,401
250,000.....	4,799	4,490	4,355	4,950	2,945
500,000.....	6,603	5,780	5,619	6,660	na
750,000.....	7,856	6,305	6,149	7,718	na
1,000,000.....	8,795	6,259	6,138	8,374	na
2,000,000.....	10,737	na	na	8,120	na
3,000,000.....	10,668	na	na	na	na
4,000,000.....	8,539	na	na	na	na

na not applicable

NOTES: "Scientists and engineers" include all people holding a bachelor's degree or higher in an S&E field plus people holding a non-S&E bachelor's degree or higher who were employed in an S&E occupation during the 1990s SESTAT surveys. "White" excludes persons of Hispanic origin, who are instead included in the "nonwhite" category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT).

Appendix table A-10

Scientists and engineers in 1999 (total population): β_0 and β_1 parameters for specified demographic groups

Degree field and occupation	Parameter	Total	Male	Female	White	Nonwhite
All scientists and engineers.....	β_0	-0.00002	-0.00003	-0.00005	-0.00003	-0.00006
	β_1	307.74838	281.62859	297.07774	315.22684	173.25637
Field of highest degree						
Computer/mathematical sciences.....	β_0	-0.00014	-0.00021	-0.00040	-0.00022	-0.00021
	β_1	238.30346	250.50661	225.56489	281.30536	151.88338
Life sciences.....	β_0	-0.00010	-0.00019	-0.00030	-0.00013	-0.00029
	β_1	263.04618	276.56190	297.08279	274.29995	162.97016
Physical sciences.....	β_0	-0.00013	-0.00020	-0.00040	-0.00017	-0.00045
	β_1	191.05037	211.65869	171.46532	217.56020	121.16321
Social sciences.....	β_0	-0.00006	-0.00014	-0.00013	-0.00008	-0.00010
	β_1	391.98517	394.61136	350.07506	410.02192	218.30068
Engineering.....	β_0	-0.00003	-0.00005	-0.00009	-0.00006	-0.00014
	β_1	173.72197	184.19018	114.07917	205.42315	122.67385
Non-S&E.....	β_0	-0.00002	-0.00007	-0.00003	-0.00002	-0.00019
	β_1	362.78296	349.15063	352.27621	398.80013	229.68120
Occupation						
Computer/mathematical scientist.....	β_0	-0.00001	0.00003	-0.00022	0.00003	-0.00022
	β_1	222.17067	225.58645	263.81063	248.07716	164.28594
Life scientist.....	β_0	0.00002	-0.00011	-0.00003	-0.00004	-0.00005
	β_1	162.64087	152.08679	193.12466	185.56071	97.13051
Physical scientist.....	β_0	-0.00006	-0.00006	-0.00018	-0.00007	-0.00030
	β_1	145.22370	136.95987	150.84816	153.65366	103.17917
Social scientist.....	β_0	0.00001	-0.00027	-0.00007	-0.00004	-0.00030
	β_1	189.71994	208.67765	213.72394	191.99128	135.74938
Engineer.....	β_0	0.00002	0.00004	-0.00034	0.00004	-0.00011
	β_1	190.69903	197.17445	156.12924	188.37016	122.96701
Non-S&E occupation.....	β_0	-0.00003	-0.00005	-0.00008	-0.00004	-0.00010
	β_1	372.55391	366.62209	350.48018	388.08396	203.79014

NOTES: "Scientists and engineers" include all people holding a bachelor's degree or higher in an S&E field plus people holding a non-S&E bachelor's degree or higher who were employed in an S&E occupation during the 1990s SESTAT surveys. "White" excludes persons of Hispanic origin, who are instead included in the "nonwhite" category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT).

Appendix table A-11

Bachelor's scientists and engineers in 1999: β_0 and β_1 parameters for specified demographic groups

Degree field and occupation	Parameter	Total	Male	Female	White	Nonwhite
All bachelor's scientists and engineers.....	β_0	-0.00003	-0.00004	-0.00007	-0.00003	-0.00006
	β_1	345.76312	333.81569	321.92498	363.55902	191.13484
Field of highest degree						
Computer/mathematical sciences.....	β_0	-0.00023	-0.00041	-0.00055	-0.00031	-0.00061
	β_1	277.47804	300.98507	239.70050	294.67208	192.93481
Life sciences.....	β_0	-0.00017	-0.00034	-0.00045	-0.00022	-0.00050
	β_1	322.31076	339.91860	355.23811	342.76698	198.01218
Physical sciences.....	β_0	-0.00036	-0.00059	-0.00073	-0.00045	-0.00104
	β_1	270.32685	312.30207	219.66166	291.16354	170.87214
Social sciences.....	β_0	-0.00008	-0.00020	-0.00015	-0.00010	-0.00017
	β_1	431.44041	465.09638	367.37615	458.98435	238.39416
Engineering.....	β_0	-0.00007	-0.00009	-0.00027	-0.00010	-0.00040
	β_1	200.65872	214.80459	137.43830	228.21721	158.48280
Non-S&E.....	β_0	-0.00038	-0.00042	-0.00048	-0.00038	-0.00004
	β_1	356.29880	326.05010	392.44659	377.09712	182.68328
Occupation						
Computer/mathematical scientist.....	β_0	0.00006	0.00016	-0.00050	0.00009	-0.00027
	β_1	247.69805	260.97694	299.01424	248.49673	196.36168
Life scientist.....	β_0	-0.00041	-0.00064	-0.00053	-0.00033	-0.00423
	β_1	267.62855	282.96504	230.79496	277.87158	200.97213
Physical scientist.....	β_0	0.00018	0.00028	-0.00161	0.00009	-0.00214
	β_1	200.91399	220.12543	174.59927	223.17370	172.67648
Social scientist.....	β_0	-0.00012	0.00028	-0.00209	0.00024	-0.00813
	β_1	391.59005	329.92357	374.54928	409.08087	229.92383
Engineer.....	β_0	0.00002	0.00003	-0.00089	0.00005	-0.00020
	β_1	212.33234	218.63238	175.40824	199.92285	158.09250
Non-S&E occupation.....	β_0	-0.00003	-0.00002	-0.00011	-0.00004	-0.00005
	β_1	413.80692	397.18491	351.06926	444.24003	216.79169

NOTES: "Scientists and engineers" include all people holding a bachelor's degree or higher in an S&E field plus people holding a non-S&E bachelor's degree or higher who were employed in an S&E occupation during the 1990s SESTAT surveys. "White" excludes persons of Hispanic origin, who are instead included in the "nonwhite" category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT).

Appendix table A-12

Master's scientists and engineers in 1999: β_0 and β_1 parameters for specified demographic groups

Degree field and occupation	Parameter	Total	Male	Female	White	Nonwhite
All master's scientists and engineers.....	β_0	-0.00002	-0.00004	-0.00006	-0.00001	-0.00006
	β_1	280.81808	259.55041	318.64128	314.08432	186.33419
Field of highest degree						
Computer/mathematical sciences.....	β_0	-0.00051	-0.00066	-0.00180	-0.00108	-0.00023
	β_1	229.98609	225.03016	226.95922	316.13836	102.25294
Life sciences.....	β_0	-0.00076	-0.00159	-0.00086	-0.00092	-0.00104
	β_1	248.75495	257.14653	170.81826	273.86726	122.38972
Physical sciences.....	β_0	-0.00101	-0.00116	-0.00285	-0.00135	-0.00048
	β_1	204.79070	195.57067	197.51872	236.19915	105.83538
Social sciences.....	β_0	-0.00017	-0.00041	-0.00030	-0.00022	-0.00053
	β_1	222.66632	253.44483	213.49174	247.12989	127.55022
Engineering.....	β_0	-0.00020	-0.00023	-0.00065	-0.00031	-0.00017
	β_1	155.09404	160.56347	95.92828	192.63307	99.26671
Non-S&E.....	β_0	0.00000	0.00000	-0.00010	0.00000	-0.00026
	β_1	327.08060	298.66567	393.91455	382.99428	238.20534
Occupation						
Computer/mathematical scientist.....	β_0	-0.00026	-0.00017	-0.00066	-0.00032	-0.00022
	β_1	228.95490	191.32276	225.56785	294.06459	124.69842
Life scientist.....	β_0	-0.00093	-0.00255	0.00028	-0.00124	-0.00169
	β_1	217.07815	234.96015	204.61524	263.42916	115.99420
Physical scientist.....	β_0	-0.00068	-0.00046	0.00147	-0.00113	-0.00186
	β_1	175.23600	152.43634	198.43957	193.23003	103.11800
Social scientist.....	β_0	-0.00041	-0.00025	-0.00079	-0.00066	-0.00158
	β_1	251.97446	292.67170	236.59249	264.01161	169.67809
Engineer.....	β_0	-0.00012	-0.00010	-0.00089	-0.00005	-0.00028
	β_1	148.28276	148.01961	139.50388	164.43166	104.69653
Non-S&E occupation.....	β_0	-0.00003	-0.00011	-0.00004	-0.00003	-0.00007
	β_1	373.39630	349.62567	374.43773	410.55657	211.50237

NOTES: "Scientists and engineers" include all people holding a bachelor's degree or higher in an S&E field plus people holding a non-S&E bachelor's degree or higher who were employed in an S&E occupation during the 1990s SESTAT surveys. "White" excludes persons of Hispanic origin, who are instead included in the "nonwhite" category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT).

Appendix table A-13

Doctoral scientists and engineers in 1999: β_0 and β_1 parameters for specified demographic groups

Degree field and occupation	Parameter	Total	Male	Female	White	Nonwhite
All doctoral scientists and engineers.....	β_0	-0.00002	-0.00006	-0.00005	-0.00004	-0.00015
	β_1	97.06564	94.44642	88.59845	107.28630	72.96765
Field of highest degree						
Computer/mathematical sciences.....	β_0	-0.00028	-0.00037	-0.00179	-0.00052	-0.00077
	β_1	37.62834	41.62299	27.24175	44.38081	32.07953
Life sciences.....	β_0	-0.00010	-0.00016	-0.00036	-0.00009	-0.00037
	β_1	32.56587	34.01286	44.64157	31.20354	40.15677
Physical sciences.....	β_0	-0.00014	-0.00016	-0.00039	-0.00018	-0.00054
	β_1	33.70681	32.82507	32.26803	36.01126	37.70068
Social sciences.....	β_0	-0.00010	-0.00017	-0.00018	-0.00011	-0.00039
	β_1	29.98008	32.29567	25.01193	29.31617	26.69858
Engineering.....	β_0	-0.00012	-0.00012	-0.00156	-0.00022	-0.00004
	β_1	28.61567	29.07171	26.60185	32.84335	25.55628
Non-S&E.....	β_0	-0.00072	-0.00173	-0.00232	-0.00095	-0.00332
	β_1	373.32905	421.22255	303.59259	408.92508	249.95700
Occupation						
Computer/mathematical scientist.....	β_0	-0.00024	-0.00046	-0.00115	-0.00030	-0.00060
	β_1	53.37508	58.66742	68.91037	63.31541	36.09954
Life scientist.....	β_0	-0.00009	-0.00015	0.00008	-0.00009	-0.00031
	β_1	37.65423	37.61122	43.76323	36.29873	36.57734
Physical scientist.....	β_0	-0.00013	-0.00009	-0.00066	-0.00024	-0.00021
	β_1	36.16038	34.36691	41.93698	38.15836	39.51903
Social scientist.....	β_0	0.00010	0.00029	-0.00024	0.00008	-0.00068
	β_1	64.45554	82.28239	51.60141	62.99938	54.08267
Engineer.....	β_0	-0.00010	-0.00009	-0.00154	-0.00009	0.00008
	β_1	33.29740	34.74466	27.23506	29.48511	34.03765
Non-S&E occupation.....	β_0	-0.00011	-0.00028	-0.00017	-0.00020	-0.00064
	β_1	182.29262	190.08102	166.29516	201.24602	134.47307

NOTES: "Scientists and engineers" include all people holding a bachelor's degree or higher in an S&E field plus people holding a non-S&E bachelor's degree or higher who were employed in an S&E occupation during the 1990s SESTAT surveys. "White" excludes persons of Hispanic origin, who are instead included in the "nonwhite" category.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT).